



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

J. Barry Winder, et al.

Serial No.: 10/090,859

Filed: March 5, 2002

For: *Reactive Distillation Alkylation
Process Including In Situ
Catalyst Regeneration*

§ Atty. Docket No.: Vista-1224

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Art Unit No.: 1754

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§ Examiner: Jonas N. Strickland

RESPONSE

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

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OFFICE OF PETITIONS

Sir:

This is in response to the Office Action dated June 30, 2003.

Claims 1-7 stand rejected under 35 USC §103 as being unpatentable over *Knifton, et al* in view of *Joly, et al* and *Zhang, et al*. The rejection is respectfully traversed.

Fundamentally, it is the Examiner's position that *Knifton, et al* discloses applicant's claimed process save for periodically ceasing the introduction into the column of the olefin-containing stream while introducing an effective amount of paraffin and continuing the flow of the aromatic hydrocarbon substantially under catalyst reactions reaction zone conditions. In an attempt to cure this infirmity of *Knifton*, the Examiner resorts to *Joly, et al* and *Zhang, et al*. Neither of those references, combined with *Knifton* teaches or remotely suggests applicant's claimed process, including the regeneration step.

The Examiner's characterization of the infirmities of *Knifton, et al* are directly in point as to why neither *Joly, et al* nor *Zhang, et al* is relevant. The Examiner notes that in applicant's process, both paraffin and aromatics are present to effect a regeneration. Indeed, it is the aromatic component that effects the regeneration or rejuvenation of the catalyst. In this regard, the Examiner's attention is directed to the examples, all of which speak to the necessity for the benzene component in the regeneration step.

Turning to the *Joly, et al* reference, the process taught therein is for alkylation with $C_3 - C_6$ olefins to produce gasoline range hydrocarbons. Although the patent refers to "rejuvenation" that is effected by a wash with $C_3 - C_6$ paraffins, there is absolutely no mention in the *Joly, et al* reference that an aromatic component is required to effect such a rejuvenation. In applicant's process, the paraffin is present to assist in adjusting the regeneration temperature but in and of itself is incapable of regenerating the catalyst – it is the aromatic component that effects the regeneration. Since the *Joly, et al* reference is devoid of any teaching to effect rejuvenation using an aromatic component as claimed by applicant, the combination of *Joly, et al* and *Knifton, et al* is of no avail in rendering applicant's claims obvious.

A like situation exists with respect to the combination of *Knifton, et al* and *Zhang, et al*. *Zhang, et al* is directed towards the regeneration of catalyst used for $C_3 - C_6$ olefin alkylation using primarily isobutane. Additionally, as taught in *Zhang, et al*, the process employs a slurry phase alkylation and regeneration is not effected in the reaction vessel. Rather, the slurry phase catalyst is regenerated in a separate vessel and then fed back into the process. No such step is required in applicant's process. More importantly, in *Zhang, et al* the regeneration is effected with hydrogen in an isoparaffin wash, primarily isobutane. Like *Joly, et al*, in no instance in *Zhang, et al* is there a mention of an aromatic constituent to effect the regeneration. The key to the *Zhang* rejuvenation procedure is hydrogen stripping and hydrocracking. The regeneration process of *Zhang* is totally different from applicant's claimed regeneration process, not to mention that *Zhang* is directed toward hydrocracking in the presence of hydrogen and using a paraffin wash while applicant's process is directed to a reactive dealkylation using benzene with paraffin present only to adjust the reaction temperature of the column.

As can be seen from the above, in no way could the process of either *Joly, et al* or *Zhang, et al* be combined with *Knifton, et al* to arrive at applicant's claimed process. Perhaps more importantly, the Examiner has focused on the fact that in both *Joly, et al* and *Zhang, et al*, during the rejuvenation/regeneration steps paraffins or isoparaffins are employed. However, and as has been pointed out abundantly above, there is a stark absence in either of the secondary references of any suggestion, much less teaching, to use an aromatic component as the "regenerator."

The combination of the reference simply does not make out a *prime facie* case of obviousness. Not one of the references teaches the use of an aromatic component as a rejuvenator/regenerator in a regeneration process. Indeed, assuming *arguendo* that the process of

Joly, et al or *Zhang, et al* could be combined with the process of *Knifton, et al*, no regeneration would occur because no aromatic component would be present. Moreover, any attempt to combine the references absolutely requires resort to applicant's disclosure, a forbidden foray into hindsight analysis.

In view of the foregoing remarks, it is respectfully submitted that all claims are in condition for allowance which is hereby earnestly solicited and respectfully requested.

Respectfully submitted,



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Date: November 14, 2005

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CERTIFICATE OF MAILING

I, Cathy Hayes, hereby certify that this correspondence and all referenced enclosures are being deposited by me with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on November 14, 2005.

By: 